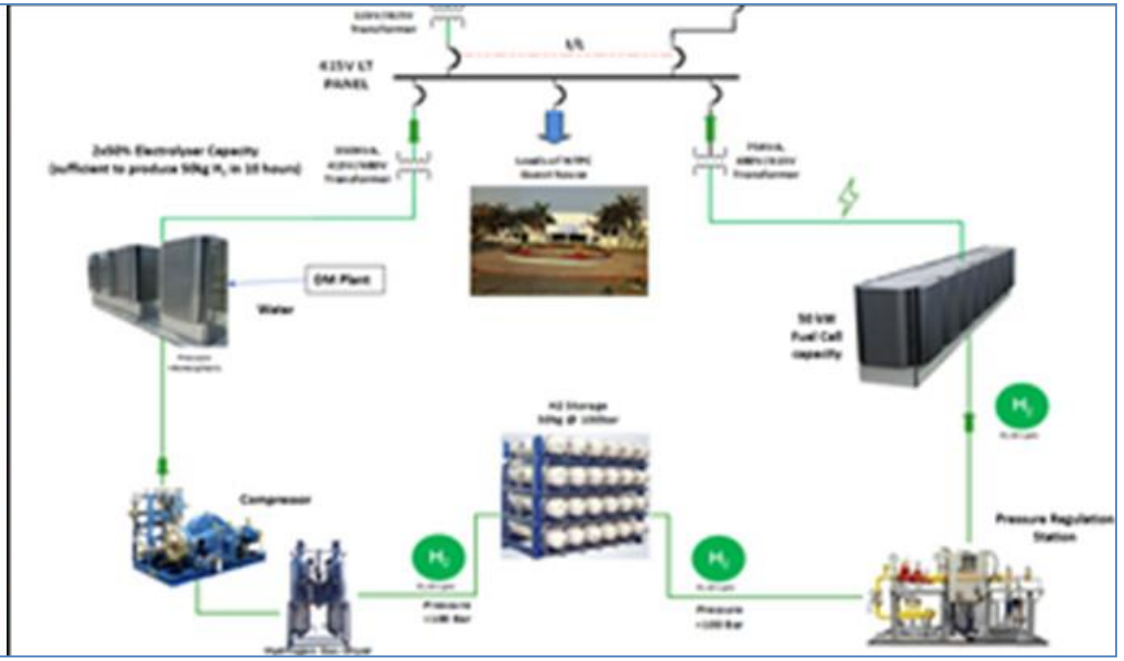
Akshay Prakas (issue No.4 of 2021)

Special issue on "News in Power Sector in Nov/Dec 2021"



NTPC: India's first Green H2 microgrid project at Simhadri AP

All info in this PPT is collected from various open sources available from the internet/News papers. I don't claim them to be 100% correct.
If you feel, my views are wrong, kindly neglect them & excuse me. I sincerely respect your views. Also kindly excuse me for my typo errors ,if any

Complied By
Vijay L Sonavane
ME(Elect)
Date: 17/12/2021

Part1: AI GEN/Coal/PEX/Trans/Dist/ Regulatory issues

- Power consumption rises 3.6% to 100.42 BU in Nov 21
- IEX power trade volume grew 54% to 9,477 MUs in Nov 21
- Discoms' outstanding dues to Gencos rise 1.3% to Rs 1.13 L CR
  - MOP asks states to allow automatic pass through of costs to Discoms
- Coal-based THM Gen rises 16.1% to 594 BU in Apr-Oct 21. CIL approves interim dividend of Rs 9/ share.
- IREDA registers all-time high half-yearly profit after tax
- 6 years doen the line, most THM plants have no system to control SO2 emission
- MAHA: Parli TPS to use 'Green coal' with crop residue as base material
- GOI considering enhancing capability of Kudankulam NUC plant from 2000 MW to 6000 MW
- IndiGrid gets LoI for Trans project in Osmanabad Dist Maha
- PUNJAB Govt tables Bills to revise PPAs
- SC asks MERC to refund surcharge collected from Captive Power users
- Cabinet approves DIST privatisation in DNH&DD
- FM NS asks MOP to study Haryana model

Power consumption rises 3.6% to 100.42 BU in Nov 21 (2/12)

- **AI Power consumption rises by 3.6% to 100.42 BU in Nov 21. In Nov 20, it was 96.88 BU & in Nov 2019, it was at 93.94 MU. During Nov 21 Peak Demd stood at 166.19 GW, higher than 160.77 GW in Nov 20**
- **At 136 Power plats generating over 165 GW IC (monitored by CEA) had coal stock of 10.96 MMT, enough for six days (at daily requirement of 1.8 MMT), which an improvement in the position coal stock at the beginning of Nov 21.**

IEX Power trade volume grew 54% to 9,477 MUs in Nov 21 (07/12)

- **Electricity trade volume at Indian Energy Exchange (IEX) rose nearly 54% Y-O-Y in Nov 21 to 9,477 MUs, comprising 6,333 MU in Conventional Power Market, 457 MU in Green Power Market & 2687 MU in Certificate Market comprising ESCerts & REC. Overall, IEX realised 53.8% YoY growth across all its market segments**

- **Day-Ahead Market achieved 4,719 MU volume in Nov 21 seeing a 3% YoY decline. AVG monthly price at Rs. 3.1 PU saw a significant 62% month-on-month (MoM) price reduction, mainly due to increased liquidity on supply-side (with sell-bids at 1.8X of the cleared volume). This ensured ample availability of power at competitive price, thereby providing optimisation opportunities to Discoms.**
  - **Term-Ahead Market comprising intra-day, contingency, daily & weekly contracts traded 302.7 MU during Nov 21 & recorded 23.4% YoY growth.**
- **Real-time Electricity Market (RTM) achieved 1311 MU volume seeing a significant 47% YoY growth. AVG monthly price was at Rs 3.48 PU.**
  - **Highest single day volume of 56.16 MU was achieved on 18th Nov with 554 participants transacting in the market. RTM has been seeing consistent growth in volumes since its inception in June 2020**
  - **Green Market at IEX comprising of both DAM & TAM contracts achieved a cumulative volume of 457 MU during Nov 21 GDAM achieved 149 MU volume during Nov 21 with the weighted average price of Rs 3.72 PU.**
  - **Green Term-Ahead Market achieved 307 MU volume with a significant 94% YoY growth.**

- **In line with CERC Order dated 18 Nov 2021, IEX resumed trading in REC market on Wed, 24th Nov 21, after a gap of almost 16 months. The market traded 2444 MU of total volume. with participation from over 800+ participants who had been eagerly waiting for resumption in order to meet their RPO & voluntary obligation.**
  - **IEX achieved a total of 24.4 Lakhs Renewable Energy Certificates (REC) trade in Nov comprising 21.90 Lakh Non-Solar RECs & 2.53 Lakh Solar REC at price of Rs 2,000 for Solar REC, & Rs 1,000 per REC for the non-solar RECs. .**
  - **IEX commenced trade in the Energy Saving Certificates (ESCerts) under Perform, Achieve & Trade (PAT) Cycle-II on Oct 26, 2021. During Nov 21, PEX accomplished trade in 242,733 ESCerts, registering a trade volume of 242.73 MU. The trade was paused until 31 Dec 2021 as per the directions dated Nov 25, 2021, issued by MOP.**

Tata Projects bags Trans project in Bangaladesh (12/11)

- **Tata Power has entered into Bangladesh's T&D sector by securing a 400 KV double ckt, 120-km project from Barapukuria to Bogura on turnkey basis . Project will be executed in 30-months & funding shall be done by EXIM Bank India under Indian Line of Credit**
  - **400KV Barapukuria-Bogura D/C Trans line shall result in expansion of EHV Trans infrastructure in the northern Bangladesh & facilitate 1600 MW power Trans from Power Plant based in Jharkhand to Bangladesh**

Discoms' outstanding dues to Gencos rise 1.3% to Rs 1.13 Lakh CR (06/12)

- Discoms owed Rs 1,11,762 CR to Gencos in Dec 2020, (Portal PRAAPTI) Total dues in Dec 2021 increased to Rs 1,13,081 CR in Nov 21
- In Dec 2021, TTL overdue amount, which was not cleared even after 45 days of grace period offered by Gencos, stood at Rs 1,01,436 CR as against Rs 98,334 CR in Dec 20. Overdue amount stood at Rs 1,00,417 CR in Nov 21. Discoms in RAJ, UP, J& K, TEL, AP, KAR,MP, MAHA, Jharkhand, TN account for major dues to Gencos
  - Overdue of IPPs amounted to 51.18% of total overdue od Discoms in Nov 21. Proportion of CPSU Gencos in the overdue was 23.95%
- NTPC has an overdue amount of Rs 4,345 CR on Discoms, followed by NLC at Rs 2,772 CR in Dec 2021.
  - Discoms owe the highest overdue of Rs 25,142 CR to Adani Power, followed by Bajaj Group-owned Lalitpur Power Genco at Rs 4,503 CR. The Overdue to NCE Gencos stood at Rs 20,319 CR in Dec 2021.

MOP asks States to allow Automatic pass thro' of costs to Discoms (12/11)

- Discoms may to pass on increase in costs to power tariffs, which can later be vetted by SERCs. Presently, there is no automatic pass through as tariff revisions need approval of SERC which leads to delay . New method will reduce requirement of Working Capital by Discoms, leading to less costs of power for consumers.
  - Because of lack of robust mechanism of timely automatic pass thro' of fuel & transportation costs, Gencos face constraints in maintaining stock of fuel. Timely collection of revenue from consumer would ensure timely payment by Discoms to Gencos & Coal Cos. This will also help in ensuring availability of supply to meet the expected increase in Demd.
- Association of Power Producers (APP) indicated that this is a proactive step by MOP. This would obviate the need to go to SERC which resulted in huge delays & avoidable litigations. This will help to bring about stability of cash flows to Gencos
  - MOP on 22nd Oct 2021 notified Electricity (Timely recovery of costs due to change in law) Rules 2021 to sustain economic viability of sector, ease financial stress by ensuring timely recovery of costs involved in electricity Gen.
- A formula has been provided to calculate adjustment in monthly tariff due to impact of change in law. Timely recovery of costs due to change in law is important as investment in power sector largely depends upon payments.

Coal-based THM generation rises by 16.1% to 594 BU in Apr-Oct 21 (08/12) ..

- Coal-based THM Gen rises by 16.1% to 594 BU in Apr-Oct 21 It was 511.9 BU in APR-OCT 20 & 565.8 BU in APR-OCT 2019.
  - Weighted average rate of sale of power by coal-based TPS during 2019-20 was about Rs 3.97 PU against Rs 3.84 PU during 2018-19.
  - AI IC is 391 GW which is sufficient to meet the highest peak demand of around 200 GW occurred till date
- Total capacity addition of Conv Gen was 5,436 MW in 20-21 & 7,065 MW in 2019-20. 213 MW HYD. India has added 2,333 MW of Conv Gen capacity in Apr- Oct 21 which includes 2,120 MW THM.
  - CIL dispatched 292 MMT during April-Oct 2021 as against 237.75 MMT in Apr-Oct 2020
- Due to increased Power demand, less Gen by imported coal-based power plants & some interruption in supply of coal due to heavy rains, the coal stock at power plants depleted to 7.2 MMT (sufficient for 4 days) as on 8th Oct 2021. It coal stock has started increasing & has now reached 17.29 MT (sufficient for 9 days as of 29/11/21.

CIL approves interim dividend of Rs 9/ share

- Board of Directors of Coal India Ltd (CIL) on, 29th Nov 2021 had approved payment of Interim Dividend for FY 2021-22 @ 9/- per share of face value of Rs 10/-
  - Shares of CIL on Monday ended 0.99% lower at Rs 154.30 on BSE.

Coal Supply by CIL to power sector rises 23% in Apr-Oct 21 (29/11) :

- Coal dispatch to the power sector by CIL rose 22.7% to 291.72 MMT in first 7 months of the on-going FY. CIL had dispatched 237.75 MT coal to power sector in April-Oct 2020.
- Coal supply by CIL to power sector during Oct 21, increased 21.7% to 47.67 MMT, over 39.17 MT in Oct 20. CIL accounts for over 80% of the domestic coal output.
  - Supply of coal to power plants in Nov21 is more than the consumption, resulting in rise of Coal stocks at THM PS. Coal stock at CIL pithead end is 32.30 MT as on 24 Nov 21 Hence there is no coal shortage

(Dividend of Rs 9/ per share of Rs 10/- & CIL wants to increase coal rate. This is how the system runs in my country, we need a Coal Regulator)

Coal India Q2 Net profit almost flat at Rs 2,937 CR (13/11)

- CIL reported consolidated net profit of Rs 2,937 CR for Q2 of FY 22, as against the net profit of Rs 2,948 CR in Q2 of FY 21.
- CIL's consolidated revenue from operations during July-Sept 2021 increased to Rs Rs 23,291 CR, from Rs 21,153 CR in July-Sept 2020. Consolidated total expenses during Q2 of FY 22 increased to Rs 20,425 CR from Rs 18,178 CR Q2 of FY 21.
  - CIL's coal production in Q2 of 2021, stood at 125.83 MMT compared with 114.98 MMT in Q2 of FY 21. Off take of Coal increased to 147.43 MMT, against 134.33 MMT a year ago. sales from e-auction in July-Sept stood at Rs 4,304 CR with an AVG realisation of Rs 1,593.36/MT.

IREDA registers all-time high half-yearly profit after tax (15/11):

- IREDA has posted a total income from operations of Rs. 685 CR & profit after tax (PAT) of Rs. 110 CR for Q2 FY22. IREDA has reported an all-time high half-yearly PAT of Rs. 300 CR, whereas its total income from operations increased to Rs. 1387 CR, up by 8%.
  - IREDA's non-performing assets reduced by 16% while its net worth grew by 22%. IREDA's loan sanctions rose by 405% & loan disbursement increased by 76%

6 years down the line, most coal-powered power plants have no system to control SO2 emission (09/12)

- Total capacity of 167 GW in India had to mandatorily install Flue-Gas Desulphuriser (FGD) system, an equipment to control toxic emissions of SO2 from TPS

THE DIRTY PICTURE:

- After 6 years of Notification, majority power plants are yet to retrofit SO2-control technology. FGD has been installed in 2.3 GW units (only 1.4%) at 2 power plant. 67 GW units have awarded bids, 98 GW yet to take any step. Researchers fear major TPS won't be able to install FGD by Dec 2022 deadline.

Suggested Action Plan:

- Install FGD at all power plants immediately & Penalize power plants that have not awarded the bids till now
- Operate power plants with SO2 controls at max capacity to reduce the need for power plants without FGD. Directing polluting plants to shut down in absence of pollution control devices
- CAQMs & CPCB to utilize air quality forecasting system efficiently

(On One hand GOVT Authorities are talking about bringing down the pollution effect, in various World Conferences (COP 26) & ground situation is: NOBODY CARES)

Two THM power units launched in Bihar (29/11)

- On 27/11 THM Gen units of 1,160 MW capacity in Barauni & Barh in Bihar: Stage -II 500MW NTPC Barauni TPS & U 1 (660 MW) of NTPC Barh STPS were dedicated to the Nation.
  - NTPC group has an installed capacity of 7,970 MW in Bihar & another 1,980 MW is under construction. Bihar Govt had transferred Barauni TPS to NTPC Ltd in Dec 2018 .

Bihar gets 401MW more power from NTPC Barh (13/11)

- 660 MW U-3 of NTPC's Barh has started commercial power production from 13th Nov midnight. Unit has successfully undergone all tests on 30th Oct 2021. It will provide Bihar further 401MW of power (Over 60% of share), remaining share of power from Barh U-3 will go to Odessa, Jharkhand & Sikkim. TTL capacity of NTPC Barh is 1980 MW. Erection, testing & optimization activities of remaining two units (660 MW each) are in advanced stage & will be commissioned during next FY

NTPC Nabinagar U-4 to begin commercial operations from 01/12 midnight (1/12) ..

- Nabinagar Super THM PS located at Sivanpur village in Nabinagar taluk (Aurangabad Dist), Bihar. Unit-4 (250 MW) of Nabinagar TPS (4X250 MW) of Bhartiya Rail Bijalee Ltd (NTPC's subsidiary), has declared it's commercial operation w.e.f. 00:00 hrs of Dec 1, 2021.
  - With this the commercial capacity of the NTPC group has become 67,907.5 MW.

MAHA: Parli TPS to use 'Green Coal' with crop residue as base material (07/12)

- Mahagenco has decided to make use of "Green-coal" at Parli TPS & has invited expression of interest from prospective bidders for supply of "Biomass Briquettes (bio Coal)" for the boiler of one of 3 units of 250MW, green coal" on an experimental basis.
  - 3x250 MW together require around 11,000-12,000 Tonnes coal/ day if the plant is operating at designed capacity. While the coal for Parli TPS is arranged from mines near HYD & Vidarbha region, the proposed use of Green coal is expected to save huge transportation cost besides offering ENV benefits & providing supplementary income to rural population.
- Mr. Pasha Patel, former President, Maha State Commission for AG & Prices, has been advocating use of "Green coal" at THM plants as use of eco-friendly fuel would give boost to Bamboo cultivation in Marathwada region.
  - Weather-resistant Bamboo plants is an ideal raw material for Green coal. Also, farmers, are in possession of large quantities of biomass in the form of AG waste. This too can be easily used for producing Green coal.
  - Patel said a single farmer can cultivate around 50 Tonne Bamboo/acre & earn an income (Rs 3,500 - 5,000/Tonne).
  - Dadri PS in UP has already initiated steps to use Green-coal.

GOI considering enhancing capability of Kudankulam NUC plant from 2000 MW to 6000 MW (03/12)

- Present opertaional capacity at Kudankulam is 2000 MW with (2x1000 MW). It will increase to 6000 MW on completion of KKNPP-3 & 4 & KKNPP-5 & 6 (4 X 1000 MW) which are under different stages of construction.
- Inter Govt. Agreement between GOI & Russia 2010 facilitates Storage & Reprocessing of Spent Nuclear Fuel of KKNPP in line with India's closed fuel cycle policy., where spent NUC fuel is regarded as a material of resource.
  - Given the very small quantity of high-level waste generated post reprocessing & technologies for separation, partitioning & burning of waste being developed by India, there is no need of a deep UG geological disposal facility in the near future

Scheme of storage of spent (used) fuel in a NUC plant is two-fold:

- The first place of storing spent fuel is located within reactor building/ service building, generally known as the spent fuel Storage pool/bay & the other is called the 'Away From Reactor' (AFR)
  - These facilities are designed with a comprehensive approach to safety to withstand extreme natural events like earthquakes & tsunamis with provisions of large operational safety margins for safe, sound & reliable performance.
  - These are designed to ensure that there would be no adverse impact on plant personnel, general public or the ENV. AFR schemes are also already constructed & functional at other sites like Tarapur, Maha & Rawatbhata, Raj,

IndiGrid gets LoI for Trans project in Maha (03/12)

- Infrastructure Investment Trust IndiGrid has received Letter of Intent (LoI) from REC Power Development & Consultancy Ltd to establish a Trans system for evacuation of power from RE projects in Osmanabad area in Maha.
  - This project is envisaged on Build, Own, Operate & aintain (BOOM) basis for a period of 35 years, thro' tariff based competitive bidding (TBCB).
- The project, with a planned outlay of Rs 170 CR will consist of one S/s of 2 x 500 MVA, 400/220 kV near Kallam & 10 Bays with a LILO multi ckt line of 18 Kms
  - Project will strengthen Trans system in Maha by improving the grid availability for evacuation & integration of RE in Maha.
  - Project is situated in a low-risk plain topography & is proposed to be compled over the next 15-18 months

India to supply 20% more electricity to Bangladesh (6/12):

- Tripura State Electricity Corporation Ltd (TSECL) will supply 192MW power to Bangladesh, an increase from the earlier 160 MW, it supplied as per earlier agreement TSECL MD MS Kele & NVVN CEO Praveen Saxena represented represented India & signed the renewal agreement in Dhaka on Dec 2. B'desh was represented by its Power Secretary & Director (BPDB. New agreement came into effect from March 17, 2021 & would be in force till 16 March 2026.

(I am very happy to inform you that I have worked with ER Kele,MD TSECL one of the most dynamic young officers in MSEB. I wish him a grand success)

PUN Govt tables Bills to revise PPAs (12/11)

- PUN Govt on 11/11 introduced two Bills in Assembly to lower the tariffs of power plants which supply electricity to PUN.
  - PUN energy security, reform, termination & redetermination of Power tariff Bill, 2021, aims to revise the terms of the PPAs between State & L&T's 1,400 MW Nabha plant & Vedanta's subsidiary Talwandi Sabo Power, 1,980 MW Stn. Bill also aims to revise the tariffs of RE plants.
- Fearing a repetition of 2019 event, when AP had unilaterally revised PPAs to reduce RE tariffs, Solar & Wind developers have written to PUN Govt requesting it not to revise tariffs of RE-based electricity being supplied to PUN
  - Move can impact around 1,000 MW solar capacities, of Azure Power, Adani Green & Acme Solar, which had signed PPAs with PUN between 2013 & 2016.
- Tariffs of these projects are generally around Rs 7 PU which is much higher than the rates of around Rs Rs 2.2-2.6/unit being currently discovered in competitive biddings in India
  - Development comes at a time when PUN is looking to reduce its PP costs amid lower revenue realisation by its Discom. PUN Govt has recently reduced power tariffs for DOM consumers by Rs 3 PU.

SC asks MERC to refund surcharge collected from Captive Power users (11/02)

- In a major relief to captive consumers of electricity like the JSW group of Cos, the Supreme Court on 10/12 held that a group of users of Captive Power Plants are not liable to pay an additional surcharge (ASC) of Rs 1.25 PU, as directed by MERC.
- A bench led by Justice MR Shah while upholding ATE's March 2019 decision said that once it is held that Captive consumers/Captive users are not liable to pay the ASC leviable uS 42(4) of EA 2003, MERC has to refund the ASC collected from captive consumers like JSW.
- However, it said that since "there shall be a huge liability on MERC if it has to now refund the amount of ASC recovered at a stretch, we direct that the ASC already recovered from the captive consumers/captive users shall be adjusted in the future wheeling charges bills."
  - Levy of an ASC uS 42(4) can be justified as compensatory in nature only where MERC permits a consumer or class of consumers to receive a supply of electricity from a person other than DL supplying of its area subject to payment of ASC on the charges of wheeling as may be specified by MERC to meet the fixed cost of such DL arising out of his obligation to supply. Ordinarily, a consumer or class of consumers receives electricity supply from DL in its area of supply.

- So far as captive consumers/captive users are concerned, no such permission of MERC is required, thus no ASC is payable by them, the SC said, adding that the captive consumers/captive users being a distinct & separate class by themselves have also to incur the expenditure and/or invest the money for constructing, maintaining or operating a CPP & dedicated trans lines."… in that case, it will be discriminatory & it can be said that unequals are treated equally," the judgment stated.
  - MERC in Sept 2018 had held that ASC is leviable uS 42(4) of EA, 2003 does not apply to Captive users to the extent of their self-consumption from such plants, but applies to all consumers who have availed OA to receive supply from sources other than DL to which they are connected.
- JSW Steel, JSW Energy, JSW Cement & other group Cos had challenged MERC's decision in APTEL, saying that MERC had ignored the concept of non-discriminatory OA in terms of the Act as well as National Electricity Policy which eliminates competition & provides a supply of power directly to consumers thro' OA.
  - APTEL also held that there cannot be any distinction between an individual captive consumer & group captive consumers or original captive consumers & converted captive consumers.

Cabinet approves DIST privatisation in Dadra & Nagar Haveli and Diu/Daman (DNH&DD) (26/11)

- Union Cabinet has approved the formation of Special Purpose Vehicle (SPV) to privatise the Dist business in UT of DNH & DD.
  - In the auction held in March 2021, Torrent Power had emerged as the highest bidder to acquire the DIST business in DNH&DD UT at Rs 555 CR for acquiring 51% stake in discoms of DNH&DD
- Equity shares of newly formed Co will be sold to highest bidder (Torent Power) & a trust will be formed for serving employees' liabilities.
- A single Discom i.e. DNH-DD Power Dist Corporation Ltd would be incorporated as a wholly owned Govt Co. & Trust(s) shall be formed to manage the terminal benefits of personnel transferred to the newly formed Co.. Transfer of assets, liabilities, personnel etc to the newly formed company will be done as per the Dadra Nagar Haveli and Daman & Diu Electricity (Reorganization & Reforms) Transfer Scheme, 2020
  - Privatisation process is expected to provide better services to over 145,000 consumers of DNH & DD, also lead to operational improvements & bring about functional efficiencies in Dist besides providing a model for emulation by other Discoms across the country.

FM NS asks MOP to study Haryana model (17/11)

- FM Nirmala Sitaraman, while chairing a meeting with CMs & States' FM thro' Video conferencing on 15/11, lauded steps taken by Haryana Govt to reduce line losses of Discoms. MOP has been directed to study HAR model on creating an enabling ecosystem for proactive facilitation for investments, besides topics of energizing growth, reforms, augmenting investments & creating a reform focused business climate.
  - AT&C losses in HAR declined from 30.02% in 2015-16 to 16.22% in 2020-21. During 2017-18, Discoms achieved operating/net profit of Rs. 412 CR by achieving a financial turnaround 2 years ahead of target. This profit was Rs 291 CR in FY2018-19 & Rs 331 CR in FY 2019-20.
- HAR Discoms have signed MOU with EESL to install 10 lakh Smart Meters in the next 3 years. 2.15 L smart meters were already installed by Dec 2020. Smart meter Services include: prepaid facility, trust reading-based billing, missed call facility to view Bill on line, making bill payment thro' post offices, consumer satisfaction rate for new consumers & average time of delivery services.

(It will be an interesting study. Normally the "jugglery" is in computing exessive AG sales to bring down losses, but getting profit is a wonerful effort by HAR Discoms)

India's Coal import rises 13% to 107 MT in April-Sept 21 (16/11)

- India's coal import rose by 12.6% to 107.34 MMT in APR-SEP 21, against the import of 95.30 MMT the coal in April-Sept 2020
  - Coal import dropped to 14.85 MMT in Sept 21, against 19.04 MMT in Sept 20, due to rise in THM & coking coal prices in the global market. Import of Non-coking coal was at 9.22 MMT in Sept 21, against 11.97 MMT imported in Sept 20. India's coal & coke imports during Sept 2021, have dropped by 2.4% over August 2021.

China's Oct coal output rises to highest since March 2015:

- BEIJING: China's Oct 21 coal output rose to the highest since March 2015, after Beijing approved a raft of coal mine expansions to tame record prices & boost supply. World's biggest producer & consumer of Coal churned out 357.09 MMT coal in Oct 21, up from 334.1 MMT in Sept 21.
  - Output over the first 10 months of 2021 was 3.3 Bn tonnes, up 4% year-on-year.

(This clearly indicates China & India are not in a hurry for Net-Zero, whatever promises they might have given in Cop-26))

India likely to have Energy Surplus of 6.4% during FY 2021-22: CEA (16/12)

- India is likely to have an energy surplus of 6.4% & a peak surplus of 9.1% for FY 2021-22, according to CEA's latest Load Generation Balance Report (LGBR).
- Report anticipates that NER, WR, SR, & NR will see surplus energy Gen of 24%, 7.9%, 7.6%, and 7.5%, respectively, in FY 2021-22. Only ER is expected to face a deficit of 5.5% during the year, which could be met from surplus power in other regions.
- The report noted that Power Demd declined amid the second wave of Covid-19 in April & May 2021. Comparison of actual & anticipated data showed a reduction of 2% & 15% in actual energy requirements in April & May 2021, Peak Demd was below LGBR forecast by 6% in April & 16% in May 2021. It also expects ER, NR, ER, NER & SR to have a peak surplus of 10.5%, 4.7%, 4.6%, 3.9%, & 1.5%, respectively, during the year.
- CEA expects Chandigarh, Uttarakhand, Kerala, Jharkhand, WB, & DVC to have energy deficits during the year. Chandigarh, DEL, HAR, PUN UP, Kerala, TEL, Puducherry, Jharkhand, Assam, Manipur, & Nagaland are anticipated to have peak deficits during the year. The widest peak deficit is expected in Chandigarh (-35.6%) & Assam (-31.8%) in 2021-22.

- **Report showed that in 2020-21, TTL ex-bus energy supply declined by 1.1% compared to FY 20-21, & peak demand met grew by 3.8%. Energy requirement registered a 1.2% decrease while peak Demd grew 3.5% during 2020-21 compared to the previous year.**
- **SR was the only region to meet its energy & peak requirements. WR met its energy requirement but faced a marginal gap of 0.1% in peak DEMD. NER showed the highest deficit in terms of energy & peak Demd at 2.5% & 5.7%, respectively.**
- **CEA expects around 11.47 GW power capacity additions during FY 22, including 10.28 GW THM, 700 MW NUC, & 493 MW HYD power**
- **For 2021-22, MoP has approved Gross Gen Program of 1,521 BU. THM is expected to generate 1,155 BU or 76% of overall Gen, while RES would generate 165 BU or 11% of TTL Gen. HEP & NUCP will account for 149.54 BU and 43.02 BU, respectively, in FY 2021-22.**
- **Per the LGBR for FY 2021-22, an energy surplus of 6.4% (94.22 BU) & a peak surplus of 8.2% (16.79 GW) is anticipated with the revised power Gen**
- **According to CEA's data, India's power supply deficit narrowed to 0.3% between April and Dec 2020, while its peak power deficit slipped to 0.6%.**
- **In FY 20-21 CEA projected that India's anticipated power supply position for 2020-21 would reflect an energy surplus of 2.7% & a peak surplus of 9.1%.**

Part: 2 RE & Battery Energy Saving Systems (BESS)

- India's total RE IC crosses 150 GW mark, including HYD
- Tata Power Solar was awarded 100 MW solar plus BESS project from SECI
- Azure Power inks PPA for 600 MW solar projects with SECI
- PM Modi lays foundation of 600 MW UM Solar Park in Jhansi
- India's solar power capacity has grown 18 times in seven years
- No Trans charge waiver for green power projects from July 2028
- MERC Order: MSEDCL: Approval for Adoption of Tariff for LT PP of 111 MW Power under MSKVY from uS 63 of EA 2003 for meeting its Solar RPO
- COP 26:
  - Decisions taken at COP 26 TOI 15 NOV: Article by Chandra Bhushan on "Good COP, Bad COP".
  - COP26 Is a Failure": Greta Thunberg Condemns U.N. Climate Summit as a "Greenwash Festival.
  - 14 MMT/day show why India & China won't quit coal

AI total RE IC crosses 150 GW mark, including HYD (30/11)

- MNRE stated that India added 1522 MW RE capacity in Oct 2021. This has raised the total RE AI capacity to 103.05 GW, which included 47.66 GW Solar, 39.99 GW Wind, 10.58 GW Bio-power & 4.82 GW SHYD.
  - With large HYD, present AI RE IC stands at 150.05 GW, while AI NUC IC is 6.78 GW. TTL non-fossil fuels based IC is 156.83 GW, (40.1% of TTL AI IC of 390.8 GW, as on 30th Nov 2021). India has committed to achieving 500 GW of IC from non-fossil fuel sources by 2030 in COP 26
- 7555 MW RE capacity has been added during FY22 till Oct 21. India has added of 7866 MW in 2020-21 & 9061 MW in 2019-20.
  - India has recorded 192,060 MU of electricity from RE, till Sept 21 during FY21-22. Power Gen from RES stood at 3,06,313 MU in 2020-21 & 2,99,901 MU in 2019-20
- 50.98 GW capacity RE Projects were at various stages of completion, while projects of 32.06 GW capacity were under various stages of bidding. Also, until Oct 31, 2021, an expenditure of Rs 2266 CR was incurred, which is 39.39% of MNRE's total budget estimate for FY 22.
  - Energy Contribution of RE is estimated to be around 20% of TTL AI Demand in FY 21-22 & 24% in FY 2026- 27

Tata Power Solar was awarded 100 MW Solar plus Battery Storage project from SECI (02/12)

- **Tata Power Solar received an LOA to set up a 100 MW project along with a 120-MW battery storage system from SECI. The project will be located at Chhattisgarh. Total contract value of the project is Rs 945 CR & will be executed within 18 months. This will be largest BESS project commissioned by TP Solar.**
  - **TP Solar's U**tility-scale EPC order book now stands at about 4.4 GW capacity with a value of **Rs 9,000 CR**

Ahead of UP Assembly Elections 22: SJVN looks to set up more RE projects in UP (02/12)

- **SJVN urged UP GOVT to allot SJVN more RE projects after bagging the 75 MW Parasan Solar Park located at Jalaun (Rs 392 CR investment). SJVN has awarded EPC contract of the project to Solarworld Energy Solutions PVT LTD. The project is scheduled to be commissioned by July 2022.**
  - **SVJN had awarded the 75 MW Jalaun Solar park, at a tariff of Rs 2.68 PU for 25 years, in a competitive bidding held by UPNEDA. PPA has been signed & the project will annually generate 4205 MU at a CUF of 26%**

RAJ top choice for investors for investments in Solar energy (16/12)

- There are favourable conditions for RE due to availability of Sunlight for 325 days out of 365 days of the year in RAJ
- State's weakness: Scorching desert & dusty storms, have become their strength today. Investment is coming in RAJ & employment opportunities are also increasing for the Youth
- In PM Kisan Yojana or RE Gen or Energy efficiency or energy conservation, RAJ has become a leading State in all fields.
  - A record 2,200 MW capacity solar power plants have been set up in 2021-22.
  - BEE declared RAJ as a front runner in the field of EE. RAJ has been rewarded for its remarkable achievements in the field of energy conservation in State Performance in Group I at a function held in New Delhi in the category of high energy-consuming states like Guj, Maha, Kar, UP, TN, MP, & HAR, RAJ's efficient management in the field of energy EE brought this award to RAJ

NTPC Renewable Energy Ltd signs PPA for 325 MW Solar projects (27/11)

- On 25th Nov 21, NTPC REL has inked PPA & other project agreements with Indian Railways , MP Power Management Co. & Rewa Ultra Mega Solar Ltd for 325 MW Solar Projects being installed in Rewa Ultra Mega Solar Ltd (RUMSL).
- NTPC RE Ltd has won a capacity of 105 MW quoting Rs 2.35 PU, & also a capacity of 220 MW quoting Rs 2.33 PU in REUMSL's auction held on 19th July 2021 for 450 MW of Solar Projects at Shajapur Solar Park in MP.
  - NTPC has won more than 6 GW of RE capacity thro' competitive biddings. NTPC REL was floated with the purpose of developing RE projects

Azure Power inks PPA for 600 MW Solar projects with SECI

- On 18/11 AZURE Power has signed PPAs for 600 MW ISTS connected Solar projects with SECI, under its 4 GW manufacturing linked projects, which will supply power for 25 years at a fixed tariff of INR 2.54 PU
  - Projects will be constructed in RAJ,, for which connectivity approval is in place & land is fully identified & is under acquisition. Commissioning timeline for the projects as per the agreement is Q3 FY 2024.
  - Azure Power is on its way to see their 4 GW pipeline turn into contracted capacity. SECI is progressing to tie up PSA for further capacity in the tender & it is expect to sign PPAs when the corresponding PSAs are in place

PM Modi lays foundation stone of 600 MW UM Solar Park in Jhansi:

- In the wake of UP assembly elections, PM on 19/11 laid foundation stone of 600 MW Ultramega Solar Park at Garautha in Jhansi. at a cost of over Rs 3,000 CR & will help provide dual benefits of cheaper Power & grid stability.

Solar Park to come up at Ramagiri (AP) (25/11):

- Ramgiri, Anantapur Dist (AP) will soon get a 300 MW Solar Park to be set up by SECI for which 70% of land has been acquired & preparation of DPR has begun. Power generated at Ramgiri will be exported to TN &KAR under the Solar Energy Export Policy. District Officials on 23/11 discussed the impediments in acquiring *the remaining land for the project.*
  - In addition to the solar park, the Discom will also get a 500 MW Pumped Storage Gen project at Chitravathi balancing reservoir & will be part of such projects being contemplated at Gandikota 600 MW, 1,200 MW at Somasila & 800 MW at Owk Reservoir. The DPRs for these projects are also under preparation & within the next one year, the project ideas would be put up for tendering/bidding, said NCE Development Corporation of AP Ltd [NEDCAP]
- During non-peak hours, these projects would pump water to a hill-top reservoir, & during the peak time, water on top of the hill would be utilised for power Gen to provide grid support.
  - Proposed sites for the Solar Energy Gen for providing free power to AG sector are also planned in Anantapur, Kadapa, & Kurnool districts.

India's solar power capacity has grown 18 times in seven years:

- AI Solar Gen IC increased from 2.63 GW in March 2014 to 47.66 GW in Oct 2021. Residential Roof top Solar PV Scheme has failed to grow in line with utility scale Solar and C&I rooftop Solar markets. It accounts for only 2.9% share of total solar capacity as of June 2021 (< 1.5 GW) due to financial viability issues & as well as severe issues policy implementation issues at local Discom level (net metering/billing/safety)

Rs 2.69-2.70 PU tariff discovered in SECI's latest wind Gen bid:

- AI IC of Wind power as on 31 Oct 2021 is 39.99 GW. Wind resource assessment conducted by the National Institute of Wind Energy indicated an estimated wind power potential of 695.5 GW at a hub height of 120 meter above ground level in India.. Tariff discovered in the latest bid of SECI for Wind Gen stood at Rs 2.69 to Rs 2.70 PU
  - As on 31 Oct 2021, the share of solar power installed capacity in the overall .. electricity capacity is 12.20 %, In terms of energy mix, it is 4.37% for FY 20-21.

- **Foundation stone of Jewar Niida airport the biggest in Asia & first net zero-emission airport in the country was laid by Hon. PM on 25 Nov 2021. The Airport is being built on 1300 Acres land. The project will be executed by the international bidder Zurich Airport International AG as a concessionaire. It will be India's first net-zero emissions airport.**

Surprise bidders in Solar Module PLI Scheme

- **In last week of Nov 2021, IREDA opened bids received under Production-Linked Incentive (PLI) scheme for solar module manufacturing. Jindal (bid capacity 4 GW, PLI bid of Rs 13.9 billion), Shirdi Sai (4 GW, Rs 18.8 billion), Reliance (4 GW, Rs 19.2 billion) and Adani (4 GW, Rs 36 billion) are the top bidders based on their technical score computed.**

First Battery Storage tender needs to be restructured:

- **SECI has issued a first of its kind standalone battery storage tender for 500 MW/ 1,000 MWh capacity. Tendered capacity is split into two projects of 250 MW/ 500 MWh capacity each to be set up in Raj near Fatehgarh ISTS S/s.**

REC Scheme due for overhaul:

- **Trading of Renewable Energy Certificates (REC) resumed on 24 Nov 2021 after a suspension lasting over 16 months due to a legal tussle over regulated prices. First trading session saw an enthusiastic response on the back of huge pent-up demand with over 3.5 million RECs traded. Trade has been resumed in line with APTEL's recent order dated 09 Nov 2021 & CERC order dated 18 Nov 2021**

No Trans charge waiver for green power projects from July 2028 : (25/11)

- MOP indicated that 100% Inter-State Trans System (ISTS) charges will be levied on power supplied by Solar & Wind plants commissioned after July 1, 2028. Currently Discoms do not have to pay ISTS charges for S/W-based gen. The waiver is an incentive to encourage RE capacity addition.
  - Wiver was initially available for S/W projects scheduled for installation within Mar 2022. The benefit was extended till June 30, 2025.
  - MOP stated that RE projects projects commissioned between July 1, 2025 & June 30, 2026 will attract 25% of applicable ISTS charges.
  - Power from projects commissioned in July 26- June 27 will be liable to pay 50% ISTS charges,
  - Electricity from RE plants coming online between July 1, 2027 & June 30, 2028 will attract 75% ISTS charges
- Pumped Storage Plant (PSP) & Battery Energy Storage system (BESS) can get benefits even if they source at least 51% of power from W/S projects.
  - ISTS charges shall be waived for solar, wind & PSP projects for 25 years from their commissioning, while BESS projects can avail the waiver for 12 years only
- Green H2 plants, commissioned within July 30 2025, will also receive ISTS charge waivers for the first 8 years of their operation. RE-based energy is being traded in spot power markets (green day-ahead & green term-ahead) will also be entitled to ISTS charge waiver till July 30, 2025
  - ISTS charges add about 25-50 PSPU to THM power. However, ISTS charge waivers are recovered by Trans utilities thro' higher tariffs on conventional electricity paid by Discoms.

MERC Order 141 of 2021: MSEDCL seeking approval for Adoption of Tariff for Long Term Procurement of 111 MW Power under 'Mukhyamantri Saur Krishi Vahini Yojana' (MSKVY) from 2 to 10 MW Capacity Projects connected to Dist Network uS 63 of EA 2003 for meeting its Solar RPO:

- **MERC vide Order dated 18 Dec 2020 had accorded approval to proceed with Competitive Bidding Process for selection of bidder at ceiling tariff of Rs. 3.30 PU under MSKVY**
  - **In the meantime, tariff of Rs. 2.36 PU was discovered in SECI tendered projects located in RAJ. Therefore, MSEDCL decided to float tenders for solar power under decentralized solar project with revised ceiling rate of Rs. 3.05 PU with cumulative capacity 1300 MW.**
  - **MSEDCL floated district wise 30 tenders on 22 April 2021 for procurement of Solar Power thro' competitive bidding**
- **MSEDCL filed Petition on 29 Oct 2021 seeking approval for adoption of tariff for long term power procurement of 111 MW Further, MSEDCL has sought approval to the RfS & PPA document floated for 1300 MW tender under MSKVY**
  - **Total 35 bids for 15 Dists were received with cumulative bidding capacity of 115 MW (9% of bid capacity at tariff of Rs 3.0/3.02/ 3.05 PU**

- All Respondents have raised common issue of **disruption in supply of solar equipment manufacturing from China & increase in GST rate.**

- **MOF on 30 Sept 2021 vide Notification No. 08 /2021 increased Goods and Service Tax (GST) on import of Solar Modules & Solar Inverter from 5% to 12%. Last date of the bid submission was 11 June 2021, & MoF Notification is increasing GST from 5% to 12%, therefore MoF Notification may be considered as a Change in Law Event.**
  - Hon'ble APTEL in its Judgement in Appeal Nos. 21 of 2019 and 73 of 2019 (Talwandi Sabo Power Ltd vs PSERC) categorically held that **Regulatory certainty is essential for a project developer.**
- **MSEDCL represented that since the PPA is yet to be signed, presently no agreement exists between the parties & as such, it is premature to seek declaration of the disruption in manufacturing capacity at China as a Force Majeure Event.**
- **MERC noted that MSEDCL has conducted transparent process of competitive bidding for procurement of Solar power.**
  - MERC accorded its approval procurement of 111 MW on long term basis from grid connected **Solar power projects under 'MSKVY** & allowed MSEDCL to enter into PPAs with the successful bidder for 25 years & such power procured from these projects shall be eligible towards fulfilment of MSEDCL.'s Solar RPO .
- **MERC also indicated that it is premature for the Respondents to claim such reliefs Rise in GST at this stage under change in law under Force Majeure as PPAs have not been signed**

Decisions taken at COP 26 (Ref: TOI 15 NOV Article by Chandra Bhushan on "Good COP, Bad COP" (page 12)

- There was a tactic acceptance of the fact that temp goals must be 1.5 & not between 1.5-2.0 degree C, as per Paris Agreement.
  - All major economies have now announced "Net-Zero" targets. Even if all these commitments are met we are on course to limit warming by 1.8-1.9 degree C. This means that we must device processes & mechanisms to hold countries accountable for there Net-Zero targets
  - Rule book of PARIS agrrement has been wrapped up. After 6 years of hackling a deal was finally stuck on market mechanism rules, which are stricter than previous ones & will allow countries like India to gain their selling carbon credits & bringing New Technologies
  - There are enough provisions in final decisions to hold them accountable for delivering $100 Bn in the near term & developing roadmap for enhanced long term Climate Finance
- Finally the need to ensure just transitions while phasing down fossil fuels has been received due recognition in final decision. Accordingly, the decision includes providing finance & technology support to developing coutries fot the just transition

However, in the final text the phrase "Phasing OUT of Coal Power" was changed to "Phasing DOWN of Coal Power by insistence of China & India, which is dilution of earler decision

"COP26 Is a Failure": Greta Thunberg Condemns U.N. Climate Summit as a "Greenwash Festival"

- 18-year-old Swedish climate activist Greta Thunberg called COP26 a "failure" when she addressed the "Fridays for Future" rally in Glasgow, which drew around 25,000 demonstrators. Her address comes after Thunberg dismissed climate leaders a month prior to the U.N. climate summit for political inaction.
- She says: "The COP 26 has turned into a PR event, where leaders are giving beautiful speeches & announcing fancy commitments & targets, while behind the curtains Govt of the Global North countries are still refusing to take any drastic climate action," said Thunberg on Friday.
  - It should be obvious that we cannot solve a crisis with the same methods that got us into it in the first place. Many peopl are starting to ask themselves, "What will it take for the people in power to wake up?"
- But let's be clear: "They are already awake. They know exactly what they are doing. They know exactly what priceless values they are sacrificing to maintain business as usual. Leaders are not doing nothing; they are actively creating loopholes & shaping frameworks to benefit themselves & to continue profiting from this destructive system. This is an active choice by the leaders to continue to let the exploitation of people & nature & destruction of present & future living conditions to take place.

- **COP26 has been named the most exclusionary COP ever. This is not a conference. This is now a "Global North Greenwash Festival", a two-week-long celebration of business as usual & blah, blah, blah. It seems like their main goal was to continue to fight for the status quo.**
  - **The most affected people in the most affected areas still remain unheard, & the voices of future generations are drowning in their Green wash with empty words/ promises. But the facts do not lie, & we know that our emperors are naked.**
- **To stay below targets set in Paris Agreement & thereby minimizing risks of setting off irreversible chain reactions beyond human control, we need immediate, drastic, annual emission cuts unlike anything the World has ever seen. And as we don't have the technological solutions that alone will do anything even close to that, that means we will have to fundamentally change our society. And this is the uncomfortable result of our leaders' repeated failure to address this crisis.**
  - **At the current emissions rates, our remaining CO2 budgets to give us the best chances of staying below 1.5 degrees Celsius will be gone within the end of this decade. And the climate & ecological crisis, of course, doesn't exist in a vacuum. It is directly tied to other crises & injustices that date back to colonialism & beyond, crises based on the idea that some people are worth more than others, and therefore had the right to steal others — to exploit others & to steal their land & resources. And it is very naive of us to think that we could solve this crisis without addressing the root cause of it.**

- **Greta Thunberg returns home after leading march in Glasgow during Cop26. The 18-year-old activist, who inspired the youth climate strike movement with her one-person school protest starting in 2018, was not invited to formally address the Cop26 conference. Ms Thunberg arrived in Glasgow by train & was mobbed by fellow campaigners as soon as she got to the station. (not by his personal Aeroplane like other LEADERS of poor countries)**
  - **Effects of India's fossil fuel addiction are already keenly felt, with a shroud of hick grey haze enveloping New Delhi each winter (even this year from 14/11) . Coal plant emissions & vehicle exhaust fumes combine with smoke from farm fire o choke DEL's 20 million residents.**
  - **On the same day that COP26 delegates were finalising the global climate accord, Delhi shut its schools for a week to keep children inside.**
- **Fiji's Attorney General Aiyaz Sayed-Khaiyum expressed "not just our astonishment but immense disappointment in the manner in which the modification clause, "a climate deal that bound countries to "phase down" but not "phase out" coal use. was been introduced"**

COP 26: Vague promises & Lost opportunity:

- **COP26 concluded on 13 Nov, 2021 with bitter disappointment. The conference was expected to provide a firm roadmap for cutting carbon emissions after the tentative goals agreed in Paris in 2015. But there were no binding commitments on emissions.**

COP 26 & India:

- **India's net zero goal, by 2070 is a big deal.** Even in a global net zero 2050 pathway, India's net zero would arrive around 2070- reason being **not all nations can move at the same pace**. Bone of contention was the variation between near-term 2030 reductions, & **no pledges in the 2050-70 window.**
  - While the US, UK, EU-27, Japan, & S Korea aim to nearly halve emissions by 2030, **India & China do not have such a reduction target for 2030**. They insisted that the wording of the final text was amended to **'phase down' rather than 'Phase Out' coal fired plants.**
- **Last minute changes reflect current realities** of individual energy markets where **countries aim to prioritise supply security over ENV goals, at least thro' medium term until other clean base load supply options are commercially available**
  - **Global Net Zero 2050 scenario, coal's share in power gen is expected to fall to less than 5% by 2050 from 35% in 2020.**
  - **Without decisive action sooner, experts warn India's emissions will soar in coming years & scuttle worldwide efforts to rein in global warming.**

- **No one in Glasgow is surprised, if COP 26 was a tug-of-war between the fossil fuel industry & developing countries, the former with 503 delegates (with affiliations to coal, oil & gas Cos), a bigger group than any country's National delegation by around two dozen people, is bound to win.**
  - **Transport sector is amongst the major emitters of CO2 globally. In India as well, 11% of total emissions of India could be attributed to transport sector alone in 2016. With the sector projected to grow further & at a faster pace than most other sectors, developing a better understanding of Transport sector its future pathways is crucial.**
- **India has been working to achieve its Nationally Determined Contribution (NDC) targets through facilitating a transition to EVs by schemes such as Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles in India (FAME India).**
  - **A smooth EV transition however, would require detailed understanding of policy framework, charging infrastructure, understanding of key areas such as battery swapping, public charging, & as the share of variable RE in the grid increases by 2030.**

14 MMT/day show why India & China won't quit coal?

(18/11)

Reasons India & China defended Coal's future at the Glasgow Climate summit:

- **No nations have added more coal-fired power-plant capacity in the past decade than these two major emitters (India & China)**
  - China & India are currently mining a combined **14MMT/day of Coal.** (China: 12 MMT/Day & India: 2 MMT/day)
  - GOI forecasts **coal capacity to grow to 267 GW by 2030 from 208 GW, now.**
- **Negotiators grappled on 13/11 with last minute changes to the COP26 pact that reduced a call to accelerate the "phase-out" of unabated coal power to a pledge to "phase-down" use of fuel following pushback from India & China**
  - **Coal Based THM Gen fell in 2020 to 34%, the Lowest in last two decades, though it remains single largest power source.**
- **In China, Coal PS accounted for about 62% of Gen last year. aims to have non-fossil fuel energy sources exceed 80% of its total mix by 2060. In India Coal is representing 72% of electricity Gen. Coal will still make up 21% of India's Electricity mix by 2050.**

Part 3: MISC: SG,EVs/ International News

- 600,000 Smart Prepaid meters for Assam Discoms
  - MP smart city projects to be probed for irregularities
  - As rain sends Chennai Smart city infra down the drain, CM Stalin commissions inquiry to probe misappropriation of funds
- EV Conference 2021 on 24th Nov 2021 at Noida: Salient issues discussed
  - Mumbai: BEST to use cloud-based solution technology for EV charging stns at 55 spots
  - Goa's State-run transport corporation gets second lot of electric buses
  - CESL, IIT-B to set-up EV Charging Infrastructure across Country
- Two more Data Center complexes of 30MW to come up in Greater Noida Data Center Park
- Next Generation Substation: Cyber Security:Main design issue
- Bihar, Jharkhand, UP emerge as poorest states in India: Niti Aayog
- Chinese firm to implement Bangladesh's first waste-to-energy project/Pak's first HYD PS under China Pak Economic Corridor begins water storage
- RWE building 117MW Battery storage system in Germany/ Japan Power prices hit near 10-month high

600,000 Smart Prepaid Meters for Assam Discom (19/11)

- It is first Smart metering project award in India to be competitively bid on a TOTEX basis, i.e. CAPEX + OPEX, & Installation is going to be delivered in 19 Circles of Assam.
  - IntelliSmart, a JV of GOI's National Investment & Infrastructure Fund & EESL, thus becomes the first Co. in Smart metering segment to deliver the program in NE Region. IntelliSmart operates with a Build, Own, Operate & Transfer (BOOT) model & will also maintain the AMI system for a total contract period of 9 years
- It entails an investment of about Rs 500 CR in Assam for enabling Smart metering in Prepaid mode & would usher transformation in Assam Dicoms thro' digitalisation process.
  - Smart metering is expected to create systemic efficiency improvements in financial & operational health of Discoms, along with consumer empowerment by giving them control on consumption based on their capacity & need as well as building transparency by providing Regular data on their consumption.

MP Smart City (SC) projects to be probed for irregularities (09/12)

- **MP Govt has initiated a probe into the SC projects worth hundreds of CRs of Rs awarded across seven SCs of MP in 2019 & investigate the tender process & expenditure amount. Currently, 587 projects worth Rs 6,600 CR are operational in 7 SCs of Bhopal, Indore, Jabalpur, Ujjain, Gwalior, Sagar & Satna.**
  - **CM ordered strict actions against anomalies found in the tenders allotted in the regime of Congress. Not only were the tenders allotted to aides of Congress Govt & their elected representatives but also tendering procedures were breached in the works awarded in 2019,**
- **Economic Offences Wing (EOW) is reported to have initiated a probe into a complaint against Bhopal SC Development Corporation Ltd (BSCDCL) alleging transparency issues in a tender worth Rs 207.5 CR, corruption & criminal conspiracy in plots sold on freehold basis for Area Based Developed (ABD) area.**
- **In another case, EOW had started investigating a complaint against Gwalior SC Development Corporation Ltd (GSCDCL) alleging transparency issues in a tender worth Rs 150 CR.**
  - **Smart Cities Mission is to be made the engine of growth of cities & there should be no problem in transferring funds from Smart City to Municipal Corporation or other agencies for basic works.**

***(It has become a routine practice: New Govt feels that the earlier ones were corrupt & non transperant & actually they also might be following same path. Neglecting that Delay is additional price in various Govt schemes, because the cost of Interest during Commissioning (IDC) goes on increasing, which is loaded to a common consumer. This is the poetical vendetta*)**

Chennai Smart City (SC) infra down the drain: CM Stalin commissions inquiry to probe misappropriation of funds (16/11)

- As SC infrastructure takes a major hit in the flood-bound Chennai, to probe the irregularities under infra-schemes, which were aimed at augmenting amenities & prevent flooding. Commission of inquiry will look into irregularities, vis-a-vis the projects & flooding in Chennai, "Whoever is responsible will be brought to book," TN CM Stalin said.
- CM has alleged irregularities & corruption in implementing schemes here under SCMission during previous AIADMK regime & blamed previous Govt for misappropriation of SC project funds.
  - Assessment of damage to crops in Cauvery Delta districts due to heavy rains was carried out. Stalin also visited the Peravallur area & scrutinised initiatives aimed at draining flood water

(Corruption everywhere. Poor politics has ruined the development in the country. The situation is declining in last decade. Let us keep development away from politics)

- *(It is very interesting to note that during an inauguration function of a Highway in UP, while coconut breaking, the coconut did not break, but the newly built Highway road did*, such a quality of work people carry out & move out because of Poilitcal Blessings)

2021 EV Conference on 24th Nov 2021 at Noida

I attended the Conference remotely. It was a wonderful discussion

- **Express Mobility, an automotive industry & B2B news web portal under Financial Express, successfully concluded the 2021 EV Conference.**
- **The 2021 EV Conference puts forward an in-depth discussion on the subject of EV ecosystem in India, including investments, Govt policies, measures for EV promotion, localisation of EV components, self-reliance in the EV industry, innovation & a lot more. Here are some of the highlights of the event.**
  - **India's commitment at recently held COP26 summit over the achievement of a net-zero emission target by 2070: to achieve this goal, *the change has to happen 'now'.***
- **"E-mobility is the future. GOI intends to have EV sales penetration of 30% for private cars, 70% for commercial vehicles, 40% for buses, 80% for two and three-WH by 2030.**
  - **GOI is supporting localisation of all EV components & Rs 57,000 CR have been allotted for the same thro' the PLI scheme.**
  - **GOI has also allocated Rs 18,100 CR for manufacturing of advanced battery cells. India has the potential to become the No. 1 EV maker in the world.**

Key takeaways from the panel discussions:

On the subject of 'Mass-Level Adoption of EVs & Challenges & Opportunities':

- Range anxiety continues to be a real hurdle in EV buying decisions.
  - However, a greater frequency of EV charging or battery swapping or fast-charging stns would ensure better visibility of charging solutions & hence help build consumer confidence, said Sohinder Gill, CEO, Hero EVs India.
- Other measures would be higher range vehicles & simple EV finance. Once a certain No. of EVs have started plying on the roads, it would improve confidence in consumers & it would then make way for exponential growth.
- Highlighting subscription model as a plausible measure for mass adoption of EVs, Ramesh Dorairajan, Tata Motors states that subscription model has been picking up pace & puts the decision in the buyers' hands.

- **Flow of info on details like locating the nearest EV charging stn needs to be made seamless, says Lalit Arora, Tata Communications.**
  - **An open platform where multiple players can provide EV charging services would improve the charging process for consumers & build confidence**
- **In terms of pushing electrification in small commercial vehicle segment, Chetan Maini, VC Sun Mobility states that the EV battery swapping model holds immense potential in easing the transition to electric 3-wheelers**

On the subject of 'Atmanirbhar Indian EV Supply chain'

- **India is rapidly becoming a major hub for manufacturing of components like motors, controllers, & also chargers.**
- **But the most important component for localisation in India is Lithium-ion cells, where we have made very little progress. This is an immense opportunity & also a serious challenge. Localisation of LI-ion cells would help tremendously in reduction of prices of EVs as the largest value of component in an EV is that of the battery pack, says Tarun Mehta, Ather Energy.**

- There are 3 main challenges that the Indian EV industry faces today, Brijesh Gubbi, Hyundai India, points out. The first is affordability, second is range anxiety, & the third is availability of EV charging infrastructure. EV battery prices should come down from 40% of EV to 25-30% in next few years.

On the subject of 'Potential of EVs in transforming Urban last-mile connectivity in India'

- Indian consumer understands what costs they would have to bear when making a vehicle buying decision. In past 2 decades when several EV players have struggled to strike the right chords with consumer, the customer experience with EVs has not been outstanding. While in a similar time frame countries like China raced ahead penetrating the electric 2-WH market & India is at a very early stage, says Pankaj Dubey, Power Global
  - Charging infrastructure & number of EVs plying the roads play a crucial role, as well as the cost of ownership has to be realistic to make EVs a success. Plus, the quality of battery packs will also have a major role since 40% of cost is of Batery & if a consumer has to replace 40% of vehicle cost every 3/4 years, it poses another challenge.

Mumbai: BEST to use cloud-based solution technology for EV Charging stns at 55 spots

- In July 2021 GOM introduced revised EV policy, aiming to achieve 25% electrification of intra-City public transport in Mumbai, Pune, Nagpur, Nasik & A'bad by 2025. GOM has also provided exemption in Road Tax, Registration charges & Property tax for EVs
- BEST has decided to set up EV Charging Stns (EVCS) at 55 locations in Mumbai & its suburbs for 2/3/4 Wheelers along with its Vans & Buses. These will have a minimum 3 & max 6 fast-charging points at each location These chargers will be operated 24X7 & each parking bay will have an area of 12 Sq. Met.
  - BEST invited bids for Request for Proposal for selection of operator for installation & operation of EVCS by sharing BEST infrastructure at various BSET bus Stns/Depotes. A software application is also being planned, using which motorists can book charging lots
- BEST will allocate available space for installation & operation of EV charging stns to the successful bidder for 10 years. The agency will be responsible for Set-up and O&M of EVCS
  - EVCS will be operated using cloud-based solution technology, which will be owned by Operator & BEST will receive real-time notifications on-demand reports on all EVSC

Goa's State-run Transport Corporation gets second lot of electric buses (06/12)

- Goa's Kadamba Transport Corporation (KTCL) on 04/12 received the second lot of electric buses fitted with features like electronically controlled air suspension, CCTV cameras, & emergency button to ensure safety of commuters. Goa CM Pramod Sawant flagged off these buses during a round table to promote Electric Mobility Event organised by MOHI GOI
  - These buses are supplied by electric bus operator, EVEY Transport Pvt Ltd.
- EVEY had received Order for 50 Electric buses from KTCL in Dec 2020 for Supply, O&M of 12-metre electric buses based on a Gross Cost Contract (GCC) / OPEX model for 10 years.
  - EVEY have completed 2nd lot of inspection & delivered the 12-meter electric buses to KTCL. EVEY is already operating 30 buses in Goa. These AC buses will have a seating capacity of 48 plus the Driver.

CESL, IIT-B to set-up EV Charging Infrastructure across Country (29/11)

- IIT Bombay has joined hands with Convergence Energy Services Ltd (CESL) in a bid to implement EV charging facilities across the country. CESL is a subsidiary of Energy Efficiency Services Ltd (EESL).
- Letter of Association was signed between CESL MD/CEO Mahua Acharya & Dr A M Pradeep, Associate Dean R&D IIT Bombay on 26th Nov 21
  - This pact will help both parties to collaborate on technological advancements to set up EV charging infrastructure that includes developing flagship products, standardizing Tech specifications & customising solutions for the Indian EV charging ecosystem.
  - Strong EV infrastructure is the key to cultivate consumer confidence in EVs.
- CESL works to build Energy solutions primarily for RE, Electric Mobility & Climate Change. It facilitates Solar development in under-served Rural Communities in India, utilising Battery Energy Storage (BESS) to deliver RE solutions. delivering electricity to street lighting, AG pumps, cooking appliances & domestic lighting in villages.

2 more 30 MW Data Center complexes to come up in Greater Noida Data Center Park:

- GREATER NOIDA: Foreseeing increased Demd from NR due to digital acceleration, YOTTA Infrastructure announced that it will commence construction of two more data centers in their Greater Noida Data Centre Park in Jan 2022. Two buildings will have a capacity of 30MW IT load each & will be ready to go live in Jan 2024.
  - Construction of first of six Data Center Buildings started in Jan 2021 & will go live for customer operations by July 2022, in a record time of less than 18 months. Once completed, it will have a capacity of 30 MW IT Load.
- This will be the first data center park in the region, which will consist of 6 interconnected data centre buildings offering 30,000 racks capacity powered by more than 250 MW power. The estimated cost to set up the park is approximately Rs 7000 CR (~USD 950 Mn).
  - Noida Data center park will be powered by redundant 220 KV express feeders & an on-site S/s, with an option of 100% green energy to customers
- YOTTA has also signed MoUs with TN & WB Govt to set up data centres in Chennai & Kolkata. YOTTA recently announced that its first data center in Navi Mumbai the only Tier IV Constructed Facility certified by Uptime Institute (USA).

GOI's New Data Center Policy to simplify rules & attract capital. Focus on ease of doing business

- **Netmagic** has planned capacity expansions in **Mumbai, Chennai & Bengaluru.** Adani group plans to invest up to Rs 70,000 CR to set up **solar powered data parks in AP: Oracle announced** the launch of its **Gen 2 Cloud region** in **Mumbai & HYD**
  - STT GDC which currently has a capacity plans to grow further to **200 MW over 4 million sq ft, within three years**
- Reliance IND partnering with Microsoft to **provide cloud services to small & medium enterprises** Carlyle Group acquires 25% stake of US$ 235 Mn for buying a quarter of Airtel's Nxtra in India

Key Signpost: India's Data center footprint is assessed at 7-8 million square feet. It is probably going to develop to 30 Mn SQ feet by 2030 & could maybe cross 100 Mn by 2060 containing 5,000 edge data centers. India's datacenter market is expected to be hover around USD 4-5 Bn by 2025

Next Generation Substation

- Aim of "Next Generation S/Stn": to create & deploy S/Stns that provide a security level according to organization goals, ensuring the reliability & availability of service.
  - Digital era presents "New Cyber Security threats" that should be addressed. No. of attacks oriented to Smart Grid & IoT devices are increasing dramatically during last few years with IT/OT convergence. While deployment of IoT devices & digitalization of S/stns carries out new business models & benefits in terms of efficiency, also expand surface attack bringing new cybersecurity risks. Deploying a S/s without suitable cyber security measures might result in serious consequences.

Some examples of recent cyber attacks to Energy domain:

- BLACK ENERGY,2015: Attackers stole & posted online the plans & manuals for two nuclear reactors, as well as data of 10,000 employees
- UKRAINE 2015: Sabotage of Ukrainian Power Co control room Info, cutting power to 225,000 households
- UKRAINE 2016: KYIV area without Power for an hour, after disabling an electricity S/s in Ukraine by hackers

- **SAUDI ARAMCO 2017:** Targeted the safety system in one of the Co's petrochemical plant
- **ENTSO-E 2020**: Cyber intrusion into its office network holding info regarding Power grids

CRASH OVERRIDE: Features of this industrial malware are:

- Sends commands directly to the RTU using IND protocols, including the opening & closing of breakers (S/s switches) quickly & continuously, just like Black-Energy.
  - Blocks serial ports of Windows devices, preventing communications between legitimate devices & affected devices.
- Carries out a network discovery thro' the OPC protocol & a port scanner, considerably improving the probability of success
  - was able to exploit a recognised vulnerability of Siemens SIPROTEC relays, which can lead to a denial of service.
  - Includes a wipe module (deletes data & any other file that could lead to its tracking, or specific files) that renders Windows systems useless & a reconstruction or a backup copy is required to put it back into operation.

CYBERSECURITY CHALLENGES:

- S/stn currently in use were built prioritizing functionality over security, as a result, significant technical, people & process security gaps are present.
  - Cybersecurity is not only about technology but also about People, Process, Culture & Awareness.

PEOPLE & PROCESS GAPS:

- Accountability, ROLES & RESPONSIBILITIES are often unclear.
  - GOVERNANCE is rarely well established, especially in areas of identity & asset management (IAM), Change management & Patch management, & do not often involve security
- GENERATIONAL SUCCESSION issues coupled with staff that lack SECURITY EXPERTISE (limited pool).
  - Industrial device manufacturers' PRODUCT DEVELOPMENT processes do not often address or incorporate cybersecurity qualities or values.
- Response plans do not ADDRESS CYBER EVENTS; Focus is on Maintenance & Repair Operations (MRO), but security is not directly addressed.

NTPC awards India's first Green H2 Microgrid project in AP

- **NTPC Ltd, has awarded project of 'Standalone Fuel-Cell based Micro-grid with H2 production using electrolyser' at NTPC Simhadri in AP on 15th Dec 2021.**
  - **This will be India's 1st Green H2 based Energy Storage Project & one of world's largest. It would be a precursor to large scale H2 Energy Storage projects & would be useful for studying & deploying multiple MGs in various off-grid & strategic locations in India.**
- **H2 would be produced using advanced 240 kW Solid Oxide Electrolyser by taking input power from nearby Floating Solar project. H2 produced during sunshine hours would be stored at high pressure & would be electrified using a 50 kW Solid Oxide Fuel Cell. The system would work in a standalone mode from 1700 to 0700 Hours .**
  - **This unique project configuration is designed in-house by NTPC & would open doors for decarbonising far-off regions of India like Ladakh, J&K etc., hitherto dependent on Diesel Gens..**
    - **NTPC Ltd present IC Gen is 67,908 MW (including 13,425 MW through JVs/ Subsidiaries) comprising of 47 NTPC stns (23 coal-based, 7 gas-based , 1 HEP, 1 SHYD, 14 solar PV & 1 wind-based station) & 26 JV stations (9 coal based, 4 gas based, 8 HYD, 1 SHYD ,2 wind & 2 solar PV).**

Chinese firm to implement Bangladesh's first Waste-To-Energy (WTE) projects: (3/12)

- A Chinese firm has signed four project investment agreements on a WTE project with its Bangladeshi partners. According to the agreements signed on 01/12, China Machinery Engineering Corporation (CMEC) will set up a 42.5 MW WTE plant at Aminbazar on the outskirts of Capital Dhaka. Several Bangladeshi ministers, officials & Chinese Ambassador to Bangladesh Li Jiming attended the signing ceremony
  - Bangladesh has long been pursuing a WTE project to ensure proper municipal waste management in Dhaka, It's a a 25-year deal with CMEC, which will implement the project to process around 3,000 tonnes of fresh waste per day collected from Dhaka
- Chinese firm was selected among 17 bidders, as they found it to be technically & financially viable for this project.

Pak's first HYD PS under CPEC begins water storage

- **Islamabad: Karot HEP, the 1st HYD PS project under China-PAK Economic Corridor (CPEC), is close to completion as it began storing water in its reservoir for future use.**
  - **PAK officials described the development as a "big milestone" as the HEP successfully closed the gates of diversion tunnels on 20/11 to start reservoir impoundment, the accumulation of water in its reservoir. Around 95% of the project has been completed. 4x180 MW HEP are expected to generate power in the first half of 2022.**
- **Clean energy: Karot HEP is located on Jhelum River in NE PAK, about 65 Kms from the Capital Islamabad. It is the 4th of five cascade HEP stations planned for Jhelum River. 720 MW project will enable PAK to access cheaper & greener power, help resolve power crisis while creating job opportunities.**
  - **Cost & investors: Built at an estimated cost of $1.7 Bn, it is a landmark Belt & Road Initiative (BRI) project as it is the first to be funded by China's $40 Bn Silk Road Fund. Project is managed by PAK's Karot Power Co. & major investment comes from China Three Gorges Corporation, which is among the world's largest producers of HEPs. Project has been developed on a Build-Own-Operate-Transfer (BOOT) basis.**

RWE is building 117MW BESS in Germany (23/11)

- RWE is building 117 MW Battery Energy Storage System, one of the largest BESS in Germany at Lower Saxony, This project will provide new services including grid stability to support fluctuations in RE supply, as well as storing additional supply for its other power plants along the river Mosel.
  - RWE stated that the coupling process with its other plants will raise the total capacity of 420 Li-ion batteries in place by 15%. BESS in RE transition: helps smooth fluctuations in utility grid, which are becoming increasingly common with the rise of RE
- RWE has started construction of BESS project, with a total capacity of 117MWh (€50 million (£43m) system) It is being installed across two locations & coupled with HYD stn in Lingen in Lower Saxony & Werne in North Rhine-Westphalia. System at Gersteinwerk in Werne will have a capacity of 72MWh & at Emsland station in Lingenwill have a 45MWh capacity: consists of 420 Li-ion battery racks, housed in 47 overseas shipping containers.
  - They will be virtually coupled with RWE's run-of-river HEP along river Mosel & by increasing or decreasing the flow-thro' at these power plants, it can make additional capacity available & also help balance energy.

Singapore's Switch to Renewables Comes as Global Solar IND Sees Acceleration in Technological Development (09/12)

- "Singapore has set a target of deploying 2 GWp of solar energy by 2030, equivalent to powering about 350,000 households," says Trina Solar President (Asia-Pacific), Todd Li.
  - Todd says Singapore continues to encourage adoption of solar & this move is timely because, the global solar industry has recently introduced new technologies that dramatically increase solar modules' efficiency & power output. This provides more choices for Singapore on its path to achieve its solar energy goals.
- "Last year Trina Solar unveiled its 600W Vertex module series & strongly advocated deep end-to-end supply chain integration & innovation.
  - The 600W+ PV industry chain drives technological innovation & harnesses the strengths of each segment while coordinating the supply chain.
  - It also promotes standardization & wards off potential risks from excessive overlapping investment in same-class technology as the industry is upgraded.

Japan Power prices hit near 10-month high (16/XI)

- TOKYO, Nov 1: Electricity prices in Japan rose to their highest in nearly 10 months on 16/11/21 amid elevated global prices for LNG & Coal: main fuels to supply Japan's $150 Bn power market.
  - While Coal & LNG prices have pulled back from records in Asia, they remain high just as Japanese buyers are tempted back into spot market to keep stocks high for coming winter season & resultant higher Demd.
- Price for delivery of electricity early on 15TH Nov 2021 morning quoted on the Japan Electric PEX (JEPX) reached 63 yen ($0.55PU) the highest since late Jan & above the near-ten month high of 55 yen seen in early Nov 21, because of lowest Solar Gen availability.
- Japanese buyers of LNG are scouting for cargoes to ensure they have adequate supplies of super-chilled fuel to meet peak heating Demd this winter, while preparing to use fuel oil as a backstop.
  - Elevated electricity prices in recent weeks are reviving memories of last winter when prices hit record highs due to fuel shortages & Japan's Grid nearly failed in the worst energy crisis since the Fukushima disaster.

Thanks! Your kind Response is awaited!!

(Contact: vlsonavane@gmail.com 9833362062)